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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/760,967	01/20/2004	Takahiro Iwasawa	10873.1390US01	1494

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EXAMINER	
CUTLER, ALBERT H	
ART UNIT	PAPER NUMBER
2622	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/10/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/760,967	IWASAWA ET AL.	
	Examiner	Art Unit	
	Albert H. Cutler	2622	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 January 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *20 January 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This office action is responsive to application 10/760,967 filed on January 20, 2004. Claims 1-8 are pending in the application and have been examined by the examiner.

Information Disclosure Statement

2. The Information Disclosure Statement (IDS) mailed on March 3, 2004 was received and has been considered by the examiner.

Priority

3. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claims 1-3, 6, and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wilder et al.(U.S. Patent 5,262,871) in view of Koizumi et al.(U.S. Patent 7,015,964).

Consider claim 1, Wilder et al. teach:

A MOS solid-state imaging element(image sensor, 10, figure 1, column 4, lines 45-48, column 10, line 57 through column 11, line 7) having a photodiode(P.D., figure 5A) for each pixel(figure 5A is a pixel), comprising:

a range specifying portion for determining a density of a signal spacing between selection signals for selecting pixels to be read out according to a range in which a resolution is to be different in an image and a resolution of the range(See column 4, line 54 through column 5, line 22. A processor/computer supplies supervisory signals(i.e. range specifying signals) which control the readout of the image sensor(i.e. control selection signals). The supervisory signals "determine which pixel signals and how many pixels signals are read out at any one time". The supervisory signals also "determine whether the pixel signals from a particular region are read out individually or combined into superpixel signals(i.e. determine a density of the signal spacing in the pixel readout)". The whole array or only particular areas of the array(i.e. ranges of the array in which the resolution is to be different in an image) may be selected for readout at different resolution levels. The supervisory signals determine the resolution at which

a range of an image signal is read out by either reading out all the pixels, or combining groups of pixels into superpixels. Any portions(i.e. ranges) of the array can be scanned at low resolution(maximum superpixel size) or at the highest possible resolution(individual pixel signals), column 3, lines 23-28.); and

a selection portion for sending the selection signals only to pixels that have been selected from among all of the pixels by outputting the selection signals in correspondence with a specification from the range specifying portion(Supervisory signals control the sensor readout(i.e. control selection signals) and determine a region(i.e. range) of pixels which are scanned, reading out only selected pixels in a determined range(i.e. select only pixels within a range specified by the supervisory signals), column 5, lines 1-22. Other ranges can be read out as superpixel signals(i.e. groups of pixels combined).);

wherein the pixel to which a selection signal has been input outputs, as a pixel signal, a charge that has accumulated in the photodiode of that pixel(Row and column selection signals are provided to the pixels, and each pixel in turn reads out a charge accumulated by the photodiode, column 10, line 60 through 11, line 32.).

However, Wilder et al. do not explicitly teach that each pixel has an amplifier, or that the amplifier of each pixel outputs the pixel signal accumulated by the photodiode.

Koizumi et al. is similar to Wilder et al. in that an MOS device is used(column 1, lines 21-33) as an image pickup device(column 4, lines 47-54), and photodiodes are used to convert light into electricity(column 4, lines 55-61). Koizumi et al. also teach that selection signals are used to read out pixels(column 5, lines 1 and 2).

However, in addition to the teachings of Wilder et al., Koizumi et al. teach that each pixel(figure 1) has an amplifier(Q3), and that the amplifier(Q3) of each pixel outputs the pixel signal accumulated by the photodiode(column 4, line 55 through column 5, line 2).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to connect the individual pixels taught by Wilder et al. to amplifiers as taught by Koizumi et al. for the benefit of producing a larger, easier to work with signals, and reducing chip size by integrating the pixels and amplifiers together(Koizumi et al., column 1, lines 21-33).

Consider claim 2, and as applied to claim 1 above, Wilder et al. further teach of a memory portion storing in advance a range in which a resolution is to be different in the image and a resolution of that range(A processor/computer analyzes previous data transmitted(i.e. acts as a memory portion) from the image sensor to determine(i.e. store in advance) the range in which a resolution is to be different in the image and a resolution of that range, column 4, lines 57-62. This processor/computer then provides supervisory signals to control the resolution and range in which the resolution is different(see claim 1 rationale).)

Consider claim 3, and as applied to claim 1 above, Wilder et al. further teach that the range in which a resolution is to be different in the image and a resolution of the range, which are specified by the range specifying portion, are dynamically changed

from the outside("The supervisory signals may be generated by the processor/computer pursuant to predetermined pixel readout instructions supplied to the processor/computer through conventional input devices(i.e. dynamically changed from the outside).").

Consider claim 6, and as applied to claim 1 above, Wilder et al. further teach that when outputting image signals to the outside, information expressing a range in which a resolution is to be different in the image and a resolution of the range are added to the image signals before they are output(The computer/processor provides the supervisory signals with address signals(i.e. range and resolution signals) for the pixels to be read out(see figure 1, "Address and Resolution Level Control", column 4, line 67 through column 5, line 22). These pixel signals are then read out to the computer/processor(see figure 1). Because the computer/processor already has address information for the pixels it then receives from the image sensor, information expressing the range in which a resolution is to be different in an image and a resolution of the range are added to the image signals before they are output.)

Consider claim 7, the combination of Wilder et al. and Koizumi et al. teaches an imaging device(Wilder et al., figure 1) comprising the MOS solid-state imaging element according to claim 1(Wilder et al., "image sensor", 10, figure 1, see claim 1 rationale).

7. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wilder et al.(U.S. Patent 5,262,871) in view of Koizumi et al.(U.S. Patent 7,015,964) as applied to claim 1 above, and further in view of Oda et al.(U.S. Patent 6,795,119).

Consider claim 4, Wilder et al. teach of a MOS solid-state imaging element(see claim 1 rationale). However, the combination of Wilder et al. and Koizumi et al. does not explicitly teach that the MOS solid-state imaging element comprises a color filter for each pixel.

Oda et al. is similar to Wilder et al. in that a solid state imaging element is used as an imager in a digital camera(column 3, line 66 through column 4, line 14). Oda et al. is also similar in that the solid state imaging element is an MOS imaging element which utilizes photodiodes to readout signal charges(column 7, lines 52-62).

In addition to the teachings of the combination of Wilder et al. and Koizumi et al., Oda et al. teach that the MOS solid-state imaging element(figure 2) comprises a color filter for each pixel(see figure 2, column 5, lines 44-49).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to include a color filter as taught by Oda et al. with each pixel taught by the combination of Wilder et al. and Koizumi et al. in order to generate preliminary information used to perform Automatic Exposure/Automatic focusing, and realistic live view display on an LCD prior to capturing a desired scene(Oda et al., column 1, lines 32-37).

8. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wilder et al. in view of Koizumi et al., further in view of Oda et al. as applied to claim 4 above, and further in view of Saitoh(U.S. Patent 6,377,304).

Consider claim 5, and as applied to claim 4 above, Wilder et al. teaches of combining pixel signals in a region of lowered resolution(column 6, lines 30-39). However, the combination of Wilder et al., Koizumi et al., and Oda et al. does not explicitly teach that signals having an identical color component are mixed or averaged and then output.

Saitoh is analogous to the combination of Wilder et al., Koizumi et al., and Oda et al. in that Saitoh teaches of an image sensor(figure 12), containing a multitude of pixels(column 16, line 57 through column 17, line 8). Saito also similarly teaches that the image sensor uses MOS technology(column 16, line 57 through column 17, line 61) and that the pixels include color filters(column 17, lines 9-21).

In addition, Saitoh teaches that signals having an identical color component are averaged and then output(Saitoh teaches that two similarly colored pixels are output at a time, effectively averaging the two pixels, column 17, line 62 through column 18, line 29).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to average pixels of a common color as taught by Saitoh in the combined invention of Wilder et al., Koizumi et al, and Oda et al. for the benefit of

achieving an improved screen-refresh rate, and an improved readout time when reading out video signals(Saitoh, column 6, lines 6-20).

9. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wilder et al.(U.S. Patent 5,262,871) in view of Koizumi et al.(U.S. Patent 7,015,964) as applied to claim 6 above, and further in view of Kondo et al.(U.S. Patent 6,678,405).

Consider claim 8, Wilder et al. teaches of an imaging device(figure 1) comprising a MOS solid-state imaging element according to claim 6(10, figure 1, see claim 1 and 6 rationale). Wilder et al. also teaches of reading out different parts of the imaging element at different resolutions(column 6, lines 45-47, claim 1 rationale) thereby producing boundaries between different regions having different resolution. Wilder et al. further teaches of providing addressing information(see claim 6 rationale). However, Wilder et al. does not explicitly teach of a filter that executes filter processing at the boundary between regions having different resolutions, or that the filter portion changes a tap coefficient in conjunction with the spacing of the density in accordance with the information added to the image signals.

Kondo et al. is similar to Wilder et al. in that Kondo et al. is concerned with improving processing efficiency(column 1, lines 10-15). Kondo et al. is also similarly is concerned with image readout including pixel manipulation(column 7, lines 9-40).

However, in addition to the teachings of Wilder et al. and Koizumi et al., Kondo et al. teach of a filter(figure 1) that executes filter processing(The filter of Kondo et al.

filters pixels in order to obtain optimal blurring, column 7, line 23 through column 8, line 37.), and that the filter portion(figure 1) changes a tap coefficient("prediction coefficient", column 8, lines 4-10, figure 4) in conjunction with the spacing of the density(The tap information(i.e. tap coefficient) controls the interval between pixels(i.e. spacing of the density) constituting the tap to differ depending on the statistical value of the input image(i.e. based on input image data), column 8, lines 34-37.).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to contain a filter which executes filter processing by changing a tap coefficient in conjunction with the spacing of the density in accordance with input image data as taught by Kondo et al. in the imaging device and utilized in the boundary between different regions having different resolutions taught by the combination of Wilder et al. and Koizumi et al. for the benefit of creating a higher quality image with improved features, low noise, and free from blurring(column 1, lines 17-35).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Albert H. Cutler whose telephone number is (571)-270-1460. The examiner can normally be reached on Mon-Fri (7:30-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ngoc-Yen Vu can be reached on (571)-272-7320. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AC

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SUPERVISORY PATENT EXAMINER